TREATMENT-BASED APPROACH IN A PATIENT WITH CHRONIC LOW BACK PAIN: A CASE REPORT

By

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Abstract

Background and Purpose:

It's said that 80% of people will experience low back pain (LBP) in their lifetime.[9] Many different factors influence the cause of LBP such as age, gender, psychosocial, occupation, etc.[1,2] There's also different types of LBP such as chronic, acute, and subacute. No two cases are alike, which makes standardizing a course of treatment in physical therapy very difficult.[1,2] This case report looks at using the treatment-based classification system to direct the course of treatment with the expectations that it'll be multidimensional and unique to the patient.

Case Description:

The patient presented with signs and symptoms consistent with chronic low back pain. She fit both the stabilization and manipulation category for treatment. The patient's rehab potential was classified as excellent with estimated prognosis of 6 weeks. The patient's goals were to participate in flight school with no interruptions of pain, increase sitting/standing tolerance to over 1 hour with little to no pain to be able to perform school duties and activities like housework. The patient's treatment included: Manual Therapy, Neuromuscular re-education, and Ther-Ex in stabilization.

Outcomes:

The patient had significant improvements in all outcome measures taken after 4/6 weeks of treatment. These included ODI, FABQ, Pain rating, Prone Plank, and MMT.

Discussion:

By other research and this case report, it can be said that LBP has so many different factors that it's impossible to define what's the exact best way to treat each patient. We can, however, take the guidelines set by the APTA and Fritz to better classify and direct our treatment plan.

Key Words:

Low Back Pain, Treatment-based

Introduction

Low back pain (LBP) has been described by many sources as an epidemic.[1] With its prevalence continuously on the rise, it affects the young and the old. In fact, one source states by the time you reach your 20s the prevalence could be as high as 70-80%.[1] In outpatient physical therapy clinics about 50% of the overall patient population are those seeking treatment for LBP.[2] It is well known that there are many factors at play when it comes to LBP such as age, lifestyle, occupation, hobbies, etc. It's also known that there are many different types of LBP such as acute, subacute, chronic, recurrent, etc. It has been an ongoing debate in research on how to properly classify or group individuals with LBP because it's very multifactorial.[1,2] Classifying patients is essential for physical therapists when determining proper course of treatment. Dr. Julie Fritz published a LBP treatment-based classification approach that categorized patients into one of four categories depending on their presentation- manipulation and exercise, activities to promote centralization, stabilizing exercises, and traction.[2]

This case study was done to examine and treat a patient based off these classifications set out by Fritz as well as the guidelines set by the American Physical Therapy Association which very closely correlate with each other. This case presents a patient with chronic LBP whom falls under the stabilization category of treatment. Seeing how there's much debate on what is the correct treatment for LBP it's essential to have a case study such as this to demonstrate it's not one-size-fits-all but instead a more case-by-case basis.

Case Description

The patient is a self-referred 30-year-old female who is a full-time student in flight school. There's no significant past medical history besides the original injury 5 years ago to her low back with no specific mechanism in May of 2016. Patient has a history of seasonal allergies and a skin condition called dermatographia. Medications she's on are Ibuprofen as needed for pain, Loratadine for allergies, and a once daily oral birth control. The patient must be able to sit and stand for long periods of time (several hours). Besides the acute exacerbation of her low back symptoms, the patient is in good health. This past year she has been doing a lot more sitting and standing associated with her schooling and has progressively become more of a problem to tolerate. She has had physical therapy in the past so she decided to self-refer and see if it could help again.

She states that she feels best in the morning and as her day progresses it gets worse. She typically will work through her pain and won't let it stop her from doing anything she likes or needs to do. It's currently a 5/10, 8/10 at its worst, and 3/10 at its best. Nothing in particular was stated to alleviate symptoms. She describes her pain as pulsating at times when it's really bugging her and an achy nagging feeling when she's at rest. She can't sit or stand for any period of time over 10-15 minutes at a time. She has gotten treatment for it in the past including chiropractic care, physical therapy(unspecified), cupping, and medications. She reports chiropractic care only lasted her days and cupping worked the best out of it all. She reports she was never consistent with her HEP before.

Examination

Manual muscle testing (MMT), range of motion(ROM), reflexes, and vitals were assessed and are listed under Tables 1,2,3,4,5.[3,4] The patient completed an Oswestry Disability Index and scored a 32 and a FABQ Activity of 17/36.[6,7,8] The patients prone plank was 74 seconds and R/L side plank both 60 seconds. Patient was negative in special tests for the hip with posterior sheer, gapping, compression, Gaenslen's, supine-to-sit. In Mckenzie's repeated motions test, pain was increased with flexion and extension in standing. Hip scouring and leg length testing were negative and lumbar quadrant was positive in all directions especially posterior and to the right. The patient has a small shift to the right when she bends forward to touch toes, but it is very slight. Patient had pain when standing from flexion, also exhibiting Gower's sign

The patient presents with signs and symptoms that are consistent with chronic low back pain. She fits into both the stabilization category as well as the manipulation category for treatment according to the clinical prediction rules that's listed under Figure 1.[1,2] The current impairments identified include: Hypomobility of the lumbar spine, positive prone instability, Gowers sign, greater SLR ROM, no directional preference except pain with rotation especially to R side, pain in low back, decreased thoracolumbar rotation, decreased trunk endurance. The functional deficits are as follows: Pt unable to sit or stand for long periods of time that's required to drive, sit in a classroom, or participate in leisure activities or hobbies. After a thorough evaluation I felt from my experience working in a spine clinic that this could be resolved in 6 weeks with the combination of therapy and consistent participation in a home exercise program.[1,2] This injury has been pretty chronic with small bouts of acuteness. The patient is military and works very hard and is super motivated to be back at 100%. The patient's rehab potential is excellent. She is

aware of her diagnosis. The plans and goals have been developed and discussed with the patient. The patient's goals are as follows: Patient will be able to participate in flight school with no interruptions of pain, will decrease Oswestry by 15 points, will increase sitting tolerance to over 1 hour with little to no pain to be able to participate fully in driving and school classes, will be able to increase standing tolerance to over 1 hour with little to no pain to be able to perform school duties and activities such as housework.

The patient's treatment will include E-Stim Unattended, Group Therapy, Manual Therapy, Neuromuscular re-education, PT Eval Low Complexity, PT Re-Evaluation, Ther-Ex / Procedure, Therapeutic Activity and PT Eval Low Complexity. The patient will be seen 3 times per week for 3 weeks, then 2 times per week for 3 weeks, for a total of 15 visits.[1] Patient has consented to treatment and understands the diagnosis, prognosis and treatment goals associated with this plan of care.

Intervention

According to the Low Back Pain Guidelines the interventions for the category the patient fit in are as followed: "1. Neuromuscular re-education to provide dynamic (muscular) stability to maintain the involved lumbosacral structures in less symptomatic, mid-range positions during self–care-related functional activities. 2. Manual therapy procedures and therapeutic exercises to address identified thoracic spine, ribs, lumbo-pelvic, or hip mobility deficits. 3. Therapeutic exercises to address trunk and pelvic-region muscle strength and endurance deficits. 4. Self-care/home management training in maintaining the involved structures in mid-range, less symptom-producing positions. 5. Initiate community/work reintegration training."[1,2]

At the time of initial evaluation, the patient was educated on findings during the exam, our plan for treating them, and the prognosis. During each exercise/treatment method it was thoroughly explained on how to complete and why we were doing it. The patient was educated on a home exercise program that she could complete at the beginning and end of her days to help improve core strength and endurance, and hip strength. The patient was instructed on little exercises/stretches she could do at her desk at school when her back starts to bug her. She was also told it's ok for her to not sustain the "perfect" posture but to continuously change her posture at school and even stand at times if she can. The procedural interventions listed out by each day can be found in Table 7. The progressions and instructions used with reasoning is listed under Appendix A**.** The clinical prediction rules used from the APTA guidelines to justify course of treatment are listed under Appendix B. The patient fit in both the stabilization and manipulation CPR.[1,2]

Outcomes

After the 4th full week of 6 weeks the patient feels about 60% better. She has more than doubled her sitting and standing times to 30-40 min as well as improved her plank time to 93 seconds. Her FABQ has improved to 13/36 almost to her goal and her ODI has improved to 20. Her pain levels are coming down but recently has had a lot of board exams so it has flared up a tad. I think the patient will do well to finish out her plan of care. The patient has significantly improved on her adherence to her HEP. She has been able to complete all of her exercises in session with little to no pain and needed very minimal cueing when being taught a new exercise. All of her outcome measures by visit number can be viewed in Table 6.

Discussion

Overall, the patient's condition is improving in line with her plan of care. From the outcomes we collected, using the treatment-based approach is effective in treating chronic LBP. What we know for sure is that the patient was more adherent to her home exercises, we incorporated items like cupping that the patient reported working before, and we based the rest of the treatment off of the guidelines in the manipulation and stabilization category. This patient was unique in the sense that she did not let her pain hinder her from what she wanted to do and she was driven to get rid of it. A weakness of this study is that it doesn't follow through the patient's full plan of care due to time constraints as a student on clinical rotation.

It's hard to say that by making the plan of care multidimensional is what truly made a difference verses if we chose just one course of action because we can't start over and replicate it with the same scenarios. There have been studies that state there are no differences in effectiveness in supervised exercise programs verses home-based and that a lot of the alternative therapies such as cupping still lack evidence.[9] There are other studies that suggest most of our treatment options are better in combination and not as stand alone.[10] Overall, the big message given by research and this case report is that LBP has so many different factors that it's impossible to define what is the exact best way to treat each patient because no two are alike. We can however, take from the guidelines set by the APTA and by Fritz to better categorize our treatment plan. It would be interesting for more future case studies in the same category to be investigated and to see what combinations of treatment used and their success.

References

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Tables and Figures

TABLE 1

Lumbar AROM		Comments
Flexion (40-60)	WFL	
Extension (25-35)	WFL	
Right Rotation (3-18)		grossly lacking 10 degrees
Left Rotation (3-18)		grossly lacking 10 degrees
Right Side Bending (15-20)	WFL	
Left Side Bending (15-20)	WFL	

TABLE 2

Lower Extremity AROM	Initial	Comments
Right Hip Abduction (35-45)	WFL	
Left Hip Abduction (35-45)	WFL	
Right Hip Extension (10-20)	WFL	
Left Hip Extension (10-20)	WFL	
Right Hip Flexion (120-125)	WFL	

Left Hip Flexion (120-125)	WFL	
Right Knee Extension (0-5)	WFL	
Left Knee Extension (0-5)	WFL	
Right Knee Flexion (135-145)	WFL	
Left Knee Flexion (135-145)	WFL	
Right Ankle DF (15-25)	WFL	
Left Ankle DF (15-25)	WFL	

TABLE 3

Lower Extremity MMT	Initial	Comments
R Hip Abd	5/5	Quality of movement poor, compensates with flx/ext
L Hip Abd	5	Quality of movement poor, compensates with flx/ext
R Hip Ext	5	
L Hip Ext	5	
R Hip Flex	5	

L Hip Flex	5	
R Knee Ext	5	
L Knee Ext	5	
R Knee Flex	5	
L Knee Flex	5	
R Ankle DF	5	
L Ankle DF	5	
R Ankle PF	5	
L Ankle PF	5	

TABLE 4

Reflexes		
Achilles DTR (S1)	Bilateral	+2 - Normal
Quad DTR (L3)	Bilateral	+2 - Normal

TABLE 5

Vital Signs	Height: 5' 5" Weight: 160.00lbs BMI: 26.62 BP: 111/80 HR: 67bpm

TABLE 6

Visit	**Sitting**	**Standing**	**PAIVM**	**ODI**	**Pain**	**Plank**	**Hip Abd**	**FABQ Activity**

1	10-15min	10-15 min	L1/L2 moderate Hypo	32	5/10	74 sec	5/5 poor quality	17/36
2	NT	NT	Mod	NT	6/10	NT	NT	NT
3	NT	NT	Mod	NT	5/10	NT	NT	NT
4	NT	NT	Mod	NT	6/10	NT	NT	NT
5	20min	20 min	Min	NT	4/10	81 sec	NT	NT
6	NT	NT	Min	NT	3/10	NT	NT	NT
7	NT	NT	Min	NT	3/10	NT	NT	NT
8	NT	NT	Min	NT	5/10	NT	NT	NT
9	30 min	30 min	Mostly right at Thoraco-lumbar junction slightly hypo	20	4/10	92 sec	4+/5 good quality	14/36
10	NT	NT	Very minimal	NT	4/10	NT	NT	NT

11	30-40 min	30-40min	Very minimal	20	3/10	93 sec	4+/5	13/36

TABLE 7

Day 2	**Sets**	**Weight**		**Day 3**	**Sets**	**Weight**	
Lumbar Swiss Ball Press	3X10 with 5 sec holds			Lumbar Swiss Ball Press	3x10 with 5 sec holds		
Plank(hands)	3x30sec			Plank(hands)	3x30sec		
Thoracic AROM Rotations	3x10 each side			Thoracic AROM Rotations	3x10 each side		
Multifidus Press out	3X8 each way	10lb resistance band		Multifidus Press out	3X8 each way	10lb resistance band	
Posterior Pelvic Tilts	3X10			Posterior Pelvic Tilts	3X10		
Bird Dogs	3X8 each way			Bird Dogs (with ball)	3X8 each way		
Lumbar Rotation Manip				Posterior Pelvic tilt with bridge	2X15		
Cupping	5 min			Lumbar Rotation Manip			
				Cupping	6 min		
Day 4	**Sets**	**Weight**		**Day 5**	**Sets**	**Weight**	
Lumbar Swiss Ball Press	3x10 with 5 sec holds			Shuttle Arm Press Down	3X8	1 Band	
Plank(elbows)	3x30sec			Plank(elbows)	3X30 sec		
Thoracic AROM Rotations	3x10 each side			Threading The Needle	3X10 each side		
Multifidus Press out	3X10 each way	10lb Resistance Band		Multifidus Press out	3X10 each way	10lb Resistance Band	
Posterior Pelvic Tilts	3X10			Posterior Pelvic Tilts	3X10		
Bird Dogs (with ball)	2X15 each way			Bird Dogs (with ball)	2X15 each way		
Posterior Pelvic tilt with bridge	2X15			Posterior Pelvic tilt with bridge	3X10		
Lumbar Rotation Manip				Lumbar Rotation Manip			

Cupping	6 min			Cupping	7 min		
Day 6	**Sets**	**Weight**		**Day 7**	**Sets**	**Weight**	
Shuttle Arm Press Down	3X8	1 Band		Shuttle Arm Press Down	3X8	1 Band	
Plank(Ball)	3X30 sec			Plank(Ball)	3X30 sec		
Threading The Needle	3X10 each side			Threading The Needle	3X10 each side		
Multifidus Press out	3X10 each way	20lbs resistance band		Multifidus Press out	3X10 each way	20lbs resistance band	
Side Stepping	3X20' each side	Red Theraband around knees		Side Stepping	3X20' each side	Red Theraband around knees	
Bird Dogs (with ball)	2X15 each way			Bird Dogs (with ball)	2X15 each way		
Posterior Pelvic tilt with bridge	3X10			Posterior Pelvic tilt with bridge	3X10		
Lumbar Rotation Manip				Lumbar Rotation Manip			
Cupping	7 min			Cupping	8 min		
Day 8	**Sets**	**Weight**		**Day 9**	**Sets**	**Weight**	
Shuttle Arm Press Down	3X10	1 Band		Shuttle Arm Press Down	3X10	1 Band	
Plank(Ball)	3X30 sec			Plank(Ball)	3X30 sec		
Threading The Needle	3X10 each side			Threading The Needle	3X10 each side		
Multifidus Press out	3X10 each way	20lbs resistance band		Multifidus Press out	3X10 each way	20lbs resistance band	
Side Stepping	3X20' each side	Red Theraband around knees		Side Stepping	3X20' each side	Red Theraband around knees	
Bird Dogs (with ball)	2X15 each way			Bird Dogs (unstable surface)	2X15 each way		
Posterior Pelvic tilt with bridge on ball	3X10			Posterior Pelvic tilt with bridge on ball	3X10		
Lumbar Rotation Manip				Lumbar Rotation Manip			
Thoracic PA Manip				Thoracic PA Manip			
Cupping	8 min			Cupping	8 min		
Day 10	**Sets**	**Weight**		**Day 11**	**Sets**	**Weight**	
Shuttle Arm Press Down	3X10	1 Band		Shuttle Arm Press Down	3X10	1 Band	
Stirring The Pot	2X15 circles each way			Stirring The Pot	2X15 circles each way		

Threading The Needle	3X10 each side			Threading The Needle	3X10 each side		
Multifidus Press out	3X10 each way	20lbs resistance band		Multifidus Press out	3X10 each way	20lbs resistance band	
Side Stepping	3X20' each side	Red Theraband around ankles		Side Stepping	3X20' each side	Red Theraband around ankles	
Bird Dogs (unstable surface)	2X15 each way			Bird Dogs (unstable surface)	2X15 each way		
Posterior Pelvic tilt with bridge on ball	3X10			Posterior Pelvic tilt with bridge on ball	3X10		
Lumbar Rotation Manip				Lumbar Rotation Manip			
Thoracic PA Manip				Thoracic PA Manip			
Cupping	9 min			Cupping	9 min		

Appendixes

APPENDIX A

MANUAL THERAPY:

Manual Therapy		
Lumbar Rotation Manipulation at Levels L1-L3 Grade V Done to restore rotational hypomobility	Thoracic PA Manipulation at levels T8-T12 Done to restore hypomobility/stiffness of lower Thoracic spine	Active Cupping to B Lumbar Paraspinals Done because it has worked for the patient in the past, to help improve blood flow to the area and give myofascial release.

THERAPEUTIC EXERCISE:

Lumbar Stabilization Swiss Ball Presses supine

- Pt supine in hooklying on table, swiss ball placed at abdomen between arms and knees. Pt presses ball into knees with hands

Shuttle Arm Press Downs

- Pt supine on shuttle, reaches above head for arm pulley, arm extension is performed from shoulder level to abdomen while maintaining neutral pelvis.
- Progression done to increase difficulty by adding more dynamic movement with less stability.

Plank on hands -> Plank on elbows -> Plank on Swiss Ball -> Stir the pot on Swiss ball

- Position is Prone, plank on swiss ball is on elbows/forearms, stirring the pot is the same position but you will make clockwise/counterclockwise circles with arms.
- Progression done to increase difficulty by changing the lever arm and stability of surface.

Thoracic Spine AROM rotations -> Threading the needle

- Seated and actively rotating side-to-side in chair
- Threading the needle is in quadruped using a foam roller, place roller to one side outside the arm. The arm opposite of the roller reaches under and though the other arm, rolling back and forth across the roller.
- This progression was done to isolate the rotation with less chance of side bending.

Side Stepping with theraband around knees -> around ankles

- Theraband is looped and placed right above the knees, pt is to side step while maintaining tension on the band. Around the ankles is the same.
- This progression was used to increase the difficulty by changing the placement of force.

Multifidus Press Outs with various difficulty bands

- Using a resistance band, hook it to a beam or stable vertical surface. Pt stands away from the beam facing to the side of it. Pt starts standing shoulder width with band in both hands at chest. Pt keeps a tight core and extends arms in straight line away from their body resisting rotation from the band.
- The progression used was only adding weight due to difficulty for pt.

NEUROMUSCULAR RE-EDUCATION EXERCISES:

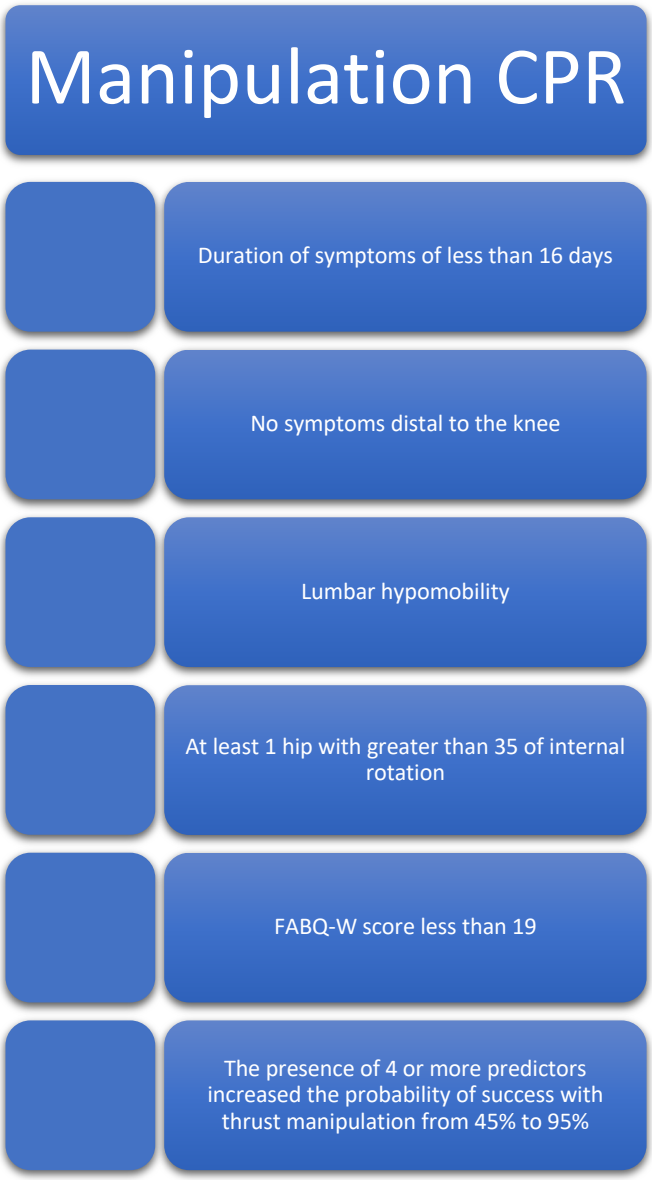
Supine Posterior Pelvic Tilts -> Posterior Pelvic Tilt with Bridge -> PPT with bridge on Swiss Ball.

- Pt lays supine on table and focuses on rotating their pelvis posteriorly. Pt then does the same thing with knees bent and performs a bridge while maintaining it. The bridge on the swiss ball, the pt is supine with legs extended and their feet/heels on the ball.
- This progression was done to increase the difficulty by contiuously providing a more unstable surface to perform on.

Bird Dog -> Bird Dog with foam ball on back -> Bird Dog with unstable surface under hands and knees

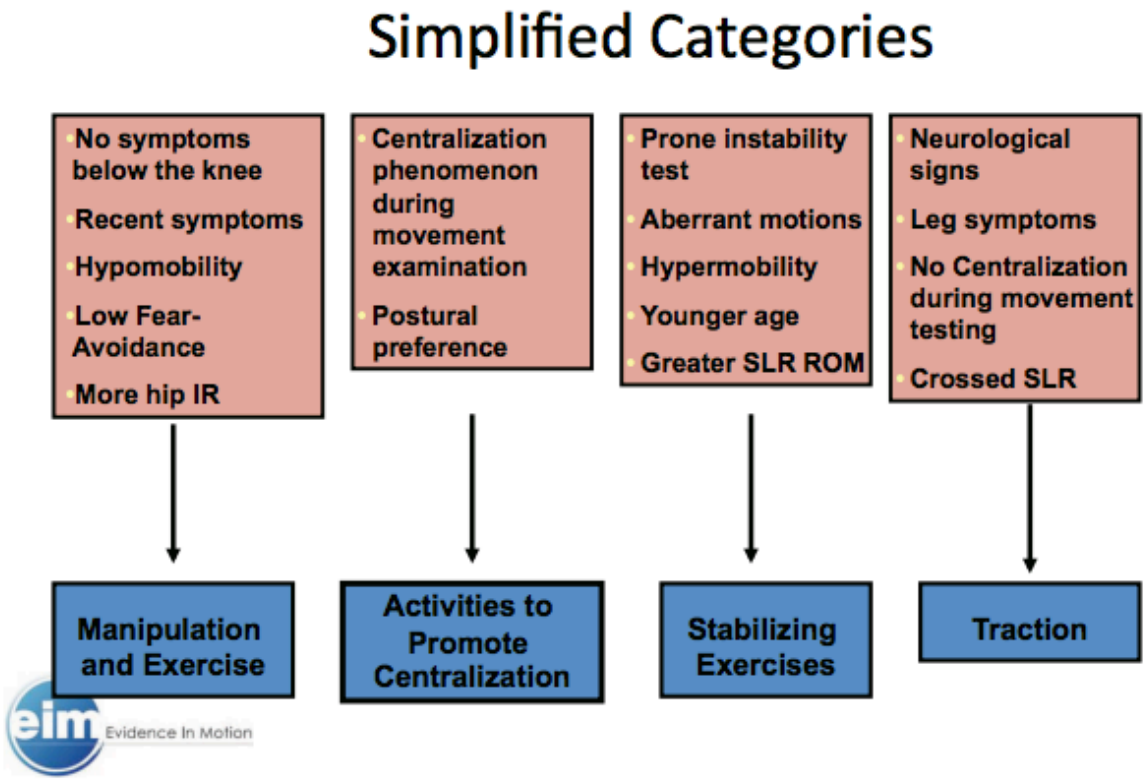
- Pt is in quadruped and extends the opposite arm and leg while maintaining a level back(no pelvis dropping down or opening up). A small ball may be placed on their lumbar spine and be challenged not to let the ball drop. Small foam or air pads may be placed under all 4 points of contact to make an unstable surface.
- These progressions were used to increase difficulty in limb control/positioning sense.

APPENDIX B


Manipulation CPR
Duration of symptoms of less than 16 days
No symptoms distal to the knee
Lumbar hypomobility
At least 1 hip with greater than 35 of internal rotation
FABQ-W score less than 19
The presence of 4 or more predictors increased the probability of success with thrust manipulation from 45% to 95%

Trunk Coordination/Endurance CPR

	Age less than 40 years
	Positive prone instability test
	Presence of aberrant movements with motion testing
	Straight leg raise greater than 91°
	A positive clinical prediction rule for stabilization was defined as presence of at least 3 of the findings (+LR = 4.0;95% CI: 1.6, 10.0)



Fritz Categories